AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1.-7. (cancelled)

8. (currently amended) A method ~~as claimed in claim 6, further comprising~~ of routing variable-length packet data across a communications network having a plurality of data communications channels, the method comprising the steps of:

a) inverse-multiplexing a data packet into a frame comprising:

i) a label block containing label information of the frame; and

ii) two or more respective payload blocks having a predetermined length;

wherein the step of inverse-multiplexing a data packet comprises the step of dividing the data packet into N packet segments of substantially equal size; and

b) transmitting the label block over a label channel of the communications network;

c) transmitting each payload block over respective separate data channels of the communications network; and

d) when the size of each packet segment is greater than a capacity of each payload block, further comprising the steps of:

~~a)~~i) subdividing each packet segment into two or more portions, each portion having a size equal to or less than the capacity of a payload block; and

~~b)~~ii) transmitting each portion within respective payload blocks of respective successive frames.

9. (cancelled)

10. (currently amended) A method ~~as claimed in claim 9, further comprising the steps of:~~ of routing variable-length packet data across a communications network having a plurality of data communications channels, the method comprising the steps of:

a) inverse-multiplexing a data packet into a frame comprising:

i) a label block containing label information of the frame, wherein the label block comprises encoded information concerning at least a start time and routing across the network of the frame; and

ii) two or more respective payload blocks having a predetermined length;

b) transmitting the label block over a label channel of the communications network;

c) transmitting each payload block over respective separate data channels of the communications network;

~~a)~~d) receiving the label block of a frame through a first port of a network node;

~~b)~~e) decoding the label block to obtain the routing information;

~~c)~~f) selecting a second port of the network node based on the routing information of the frame; and

~~d)~~g) establishing a transparent optical path between the first and second ports, such that the payload blocks of the frame are guided through the network node via the first and second ports.

11. (original) A method as claimed in claim 10, wherein the start time is indicative of a delay period between an arrival time of a first bit of the label block and an arrival time of a first bit of the payload blocks of a frame.

12. (original) A method as claimed in claim 11, wherein the start time is selected such that the step of establishing the transparent optical path is completed prior to arrival of the payload blocks of the frame at the first port of the network node.

13. (original) A method as claimed in claim 12, further comprising the steps of regenerating the label block of the frame, and transmitting the regenerated label block over the label channel through the selected second port.

14. (original) A method as claimed in claim 13, further comprising a step of delaying the payload blocks of

the frame for a predetermined period of time during passage of the payload blocks through the network node between the first and second ports, the predetermined period being selected to preserve the start time encoded in the label block as the frame passes through the network node.

15. (currently amended) A method ~~as claimed in claim 6, further comprising the steps of:~~ of routing variable-length packet data across a communications network having a plurality of data communications channels, the method comprising the steps of:

a) inverse-multiplexing a data packet into a frame comprising:

   i) a label block containing label information of the frame; and

   ii) two or more respective payload blocks having a predetermined length;

wherein the step of inverse-multiplexing a data packet comprises the step of dividing the data packet into N packet segments of substantially equal size; and

b) transmitting the label block over a label channel of the communications network;

c) transmitting each payload block over respective separate data channels of the communications network;

~~a)~~d) receiving a frame; and

~~b)~~e) de-multiplexing the payload blocks of the frame to reconstruct the data packet.

16. (original) A method as claimed in claim 15, wherein the label block comprises encoded information concerning and end time indicative of a location of a last bit of the data packet within the frame.

17. (original) A method as claimed in claim 16, wherein the end time is a number of bits of the data packet.

18. (original) A method as claimed in claim 16, wherein the step of receiving a frame comprises the steps of:

   a) receiving the label block of the frame;

   b) decoding the label block to extract the end time information; and

   c) receiving each payload block of the frame.

19. (original) A method as claimed in claim 16, wherein the step of de-multiplexing the payload blocks of the frame comprises the steps of:

   a) buffering the bits of each payload block;

   b) selecting bits of the payload blocks received prior to the end time to extract each data segment of the data packet from its respective payload block; and

   c) assembling the data segments to reconstruct the data packet.

20. (original) A method as claimed in claim 19, further comprising a step of discarding bits of the frame received after the end time.

21. (original) A communications network adapted for communication of variable size data packets, the communications network comprising:

    a) an interface for inverse-multiplexing a data packet into a frame comprising:

        i) a label block containing label information of the frame; and

        ii) two or more respective payload blocks having a predetermined length;

    b) a first optical coupler for transmitting the label block over a label channel of the communications network; and

    c) a respective second optical coupler for transmitting each payload block over a respective separate data channel of the communications network.

22. (original) A communications network as claimed in claim 21, wherein the first optical coupler is adapted to transmit the label block at a same bit rate as that of each respective second optical coupler.

23. (original) A communications network as claimed in claim 21, wherein the first optical coupler is adapted to transmit the label block at a lower bit rate than that of each respective second optical coupler.

24. (original) A communications network as claimed in claim 21, wherein the communications network is a wave division multiplex (WDM) optical network.

25. (original) A communications network as claimed in claim 24, wherein the communications network is adapted for multi-protocol label switched (MPLS) routing of packet data traffic.

26. (original) A communications network as claimed in claim 25, wherein the packet data traffic comprises any one or more of internet protocol (IP) packets and asynchronous transfer mode (ATM) frames.

27. (original) A communications network as claimed in claim 26, wherein a number N of payload blocks and the predetermined length of each payload block of each frame are selected based on an expected mean size of the data packets.

28. (original) A communications network as claimed in claim 27, wherein the interface is adapted to divide the data packet into N packet segments of substantially equal size.

29. (original) A communications network as claimed in claim 28, wherein, when the size of each packet segment is less than or equal to a capacity of each payload block, the interface is adapted to transmit each packet segment within a respective payload block of a single frame.

30. (original) A communications network as claimed in claim 28, wherein, when the size of each packet segment is greater than the capacity of each payload block, the interface is adapted to:

a) subdivide each packet segment into two or more portions, each portion having a size equal to or less than the capacity of a payload block; and

b) transmit each portion within respective payload blocks of respective successive frames.

31. (original) A communications network as claimed in claim 25, wherein the interface further comprises a label generator adapted to generate the label block including encoded information concerning at least a start time and routing of the frame across the network.

32. (original) A communications network as claimed in claim 31, wherein the start time is indicative of a delay period between transmission of a first bit of the label block by the first optical coupler and transmission of a first bit of the payload blocks by the respective second optical couplers.

33. (original) A communications network as claimed in claim 32, further comprising a network node adapted to route frames between a first and a second link of the communications network, the network node comprising:

a) a label decoder adapted to decode a label block of a frame received over the label channel through an input port connected to the first link;

b) a controller responsive to the label decoder to generate a routing control signal;

c) a switch responsive to the routing control signal to set up a transparent optical path between the

input port and a selected output port connected to the second link; and

d) a label regenerator adapted to regenerate a label block of the frame for transmission over the label channel through the selected output port.

34. (original) A communications network as claimed in claim 33, wherein the start time is selected such that the switch has sufficient time to set up the transparent optical path prior to arrival of the payload blocks of the frame at the first port of the network node.

35. (original) A communications network as claimed in claim 33, wherein the network node further comprises a third optical coupler adapted to transmit the regenerated label block over the label channel through the selected output port.

36. (original) A communications network as claimed in claim 33, further comprising delay means adapted for delaying the payload blocks of the frame for a predetermined period of time during passage of the payload blocks through the network node between the input and output ports, the predetermined period being selected to preserve the start time encoded in the label block of the frame as it passes through the network node.

37. (original) A router for routing packet data traffic between a first and a second link of a communications network adapted for communication of data packets

having a variable length, the data packets being transported within frames comprising a label block and two or more payload blocks having a predetermined length, the label block being carried on a label channel of the communications network, and the payload blocks being carried substantially in parallel on respective data channels of the communications network, the node comprising:

a) at least one input port connected to the first link for receiving sequential frames;

b) at least one output port connected to the second link for launching sequential frames into the second link;

c) a label decoder adapted to decode a label block received over the label channel through an input port;

d) a controller responsive to the label decoder to generate a routing control signal indicative of a selected output port;

e) a switch responsive to the routing control signal to set up a transparent optical path between the input port and the selected output port; and

f) a label regenerator adapted to regenerate the label block for sending over the label channel through the selected output port.

38\. (original) A router as claimed in claim 37, wherein the communications network is a wave division multiplex (WDM) optical network.

39. (original) A router as claimed in claim 38, wherein the router is adapted for multi-protocol label switched (MPLS) routing of packet data traffic.

40. (original) A router as claimed in claim 39, wherein the packet data traffic comprises any one or more of internet protocol (IP) packets and asynchronous transfer mode (ATM) frames.

41. (original) A router as claimed in claim 39, wherein the label block includes encoded information concerning at least a start time and routing of the frame across the network.

42. (original) A router as claimed in claim 41, wherein the start time is indicative of a minimum delay period between arrival of a first bit of the label block and arrival of a first bit of the payload blocks at the input port.

43. (original) A router as claimed in claim 42, wherein the start time is selected such that the switch has sufficient time to set up the transparent optical path prior to arrival of the payload blocks of the frame at the input port.

44. (original) A router as claimed in claim 43, further comprising an optical coupler adapted to transmit the regenerated label block over the label channel through the selected output port.

45. (original) A router as claimed in claim 43, further comprising delay means adapted for delaying the payload blocks of the frame for a predetermined period of time during passage of the payload blocks through the network node between the input and output ports, the predetermined period being selected to preserve the start time encoded in the label block of the frame as it passes through the network node.